

Supplementary Information

Immunomagnetic separation and size-based detection of *Escherichia coli* O157 at the meniscus of a membrane strip

Hyeonjeong Lee, Jeongin Hwang, Yunsung Park, Donghoon Kwon, Sanghee Lee, Inseok Kang, and Sangmin Jeon*

Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), 77 Cheongam-Ro, Nam-Gu, Pohang, Gyeongbuk, Republic of Korea.

E-mail address: jeons@postech.ac.kr

1. Ink absorption at the meniscus of dry/wet membrane strips

One end of a pre-wetted membrane strip was immersed into a red ink solution and taken out to observe the color change of the membrane strip (Fig. S1 (a)). After the absorption of the ink solution through the membrane, a sharp red line was formed near meniscus. Since the ink solution is not absorbed beneath the meniscus of the membrane strip, the lower part of the membrane strip did not turn red. The red ink line near the meniscus appeared more pronounced for the pre-wetted membrane strip than the dry membrane strip (Fig. S1 (b)). Upon the immersion of the dry membrane strip into the solution, the membrane below the meniscus turns red because it immediately absorbs the ink solution. On the other hand, the presence of water inside the pores of the pre-wetted membrane suppresses the permeation of the ink solution into the membrane.

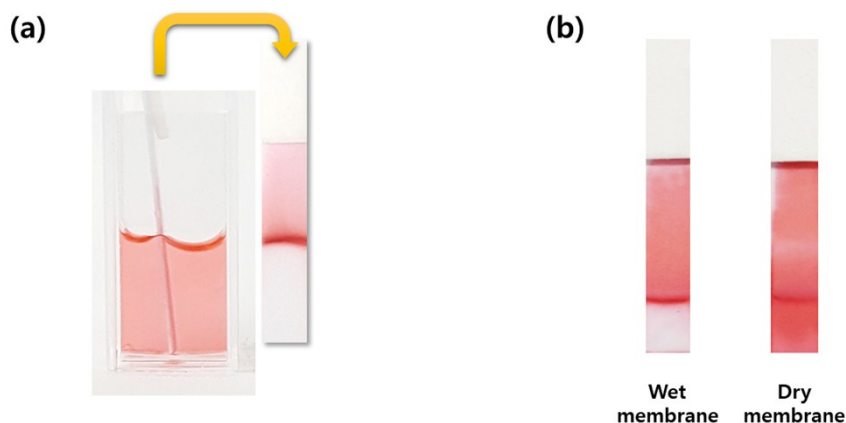


Fig. S1 (a) Color change after the immersion of a pre-wetted membrane strip into a red ink solution. (b) Color change of pre-wetted and dry membrane strips after the immersion into a red ink solution.

2. Dispersity of Au@MNCs



Fig. S2 (a) An optical image of a vial containing fresh milk. Optical images of a vial containing milk (b) immediately after the addition of 20 µg of Au@MNCs and (c) 2 h after the addition. No noticeable aggregation or precipitation of the Au@MNCs were observed.

3. Selectivity test

The strains of each bacterium used for the selectivity test are as follows; *Escherichia coli* O157:H7 (ATCC 43894), *Salmonella typhimurium* (IFO 12529), *Listeria monocytogenes* (ATCC 15313), and *Staphylococcus aureus* (ATCC 6538).